

**AMENDMENTS TO THE SPECIFICATION**

Please add the following new paragraph at page 5, line 26:

**REFERENCE TO A COMPUTER PROGRAM LISTING**

A computer program listing appendix is filed herewith on a Compact Disc-Recordable (CD-R). The material on the compact disc is hereby incorporated by reference in its entirety.

Two identical compact discs have been submitted. Each compact disc contains three files:

| File Name    | Size in bytes | Creation Date    |
|--------------|---------------|------------------|
| SEEDANLZ.CPP | 72,000 bytes  | 7/2/2003 1:20 PM |
| IMAGE.CPP    | 131,000 bytes | 7/2/2003 1:20 PM |
| IMGTHINN.CPP | 30,000 bytes  | 7/2/2003 1:20 PM |

Please replace the paragraph found at page 15, lines 19-26 with the following amended paragraph:

Referring now to Figures 10-12, an overview of the seedling analysis software of the present invention is shown. ~~The source code for a majority of the seedling analysis software is appended hereto as Listing 1, Listing 2, and Listing 3, and incorporated herein by reference.~~ A general overview 210 of the seedling analysis software is found in Figure 10, which begins at 212. As indicated at 214, the seedling analysis software requires an image of a blotter and seedlings. This preferably takes the form of a data structure corresponding to the scanned image of a blotter and seedlings that was loaded into memory with the "Open Image" icon/function.

Please replace the paragraph found at page 18, lines 11-29 with the following amended paragraph:

Next, at step 226, the smoothed, filtered binary image generated at step 224 is thinned to produce the seedling skeletons. Preferably, each object in the smoothed, filtered binary image is iteratively made thinner and thinner until the object is reduced to a number of line segments that

are one pixel in width. In the broader sense, this step is a form of medial axis transformation. The particular thinning algorithm used was adapted from N. Yagi, S. Inoue, M. Hayashi, E. Nakasu, K. Mitani, M. Okui, S. Suzuki, Y. Kanatsugu, C gengo de manabu jissen gazou shori [Learn Image Processing in C], Ohm-sha [publisher], pp. 53-54, 1997, and is set forth in Listing 3 file IMGTHINN.CPP of the computer listing appendix submitted on compact disc. The result is a thinned, smoothed, filtered binary seedling image that represents the skeletons for the seedlings in the original image. Next, object labeling as discussed above is performed on the resulting thinned, smoothed, filtered binary image, which results in a List of Objects data structure for the skeletons in the thinned, smoothed, filtered binary seedling image, i.e., a List of Seedling Skeletons, which includes for each seedling skeleton: a unique object label, the bounds of that skeleton ( $x_{min}$ ,  $x_{max}$ ,  $y_{min}$ , and  $y_{max}$ ), and the number of pixels in that skeleton. Finally, the List of Seedling Skeletons is filtered by removing all entries having fewer than a predetermined number of pixels, e.g., 15 pixels, again to eliminate any noise generated by any of the foregoing steps. This filtering action is performed in the same manner as step 222 on the List of Seedling Skeletons. At 228, program control returns to the flowchart of Figure 10.

Please replace the paragraph found at page 23, lines 25-27 with the following amended paragraph:

The following annotated pseudocode presents additional information on the determination of start junctions in each seedling skeleton (which is determined by task 226), found in Listing 4 file SEEDANLZ.CPP of the computer listing appendix submitted on compact disc:

Please replace the paragraph found at page 33, lines 1-2 with the following amended paragraph:

With that introduction, the following annotated pseudocode describes the seedling separation software, i.e., function **SeparateSeedlings** in Listing 4 file SEEDANLZ.CPP of the computer listing appendix submitted on compact disc, in further detail: